

Application No. 10/560,190
Paper Dated: October 16, 2009
In Reply to USPTO Correspondence of June 16, 2009
Attorney Docket No. 5946-091709

AMENDMENTS TO THE DRAWINGS

The attached two sheets of drawings include Figs. 6-9, which were originally included in the text of the specification at pages 10-12. The Examiner requested that these figures be included in the drawings, rather than in the text of the specification.

Attachment: Two Added Sheets

REMARKS

Claims 1-18 are currently pending in this application. Claim 19 has been cancelled, without prejudice. Claim 20 has been added.

Claim 1 has been amended to clarify that the residence time in the moving bed is independently controlled by controlling the inflow of polymeric particles into the moving bed or by controlling the outflow of polymeric particles out of the moving bed. This amendment is supported at least at page 3, lines 18-23 and original claim 3 of the specification.

New claim 20 is supported by original claim 6.

No new matter has been added to the application by the foregoing amendments.

At page 2 of the Office Action, the disclosure was objected to because of the following alleged informalities: the presence of embedded figures, viz., Figs. 6-9 on pages 10-12. The Office Action requested submission of new drawing sheet(s) containing Figs. 6-9 and deleting the figures from the body of the specification. Applicant has amended the specification at pages 10-12 to delete Figs. 6-9 and has added Figures 6-9 to the drawings. Accordingly, Applicant requests that the objection be reconsidered and withdrawn.

At pages 2-3 of the Office Action, the drawings have been objected to as failing to comply with 37 CFR 1.84(p)(5), allegedly because they include the following reference character not mentioned in the description: 20 (see Fig. 1 and of. related description on pages 7-8).

Applicant has amended the specification at page 7, lines 20-29 to add the reference character 20 to the description in compliance with 37 CFR 1.121(b). Applicant respectfully requests reconsideration and withdrawal of the objection.

Claim 19 has been objected to because of the following informalities: In the first line, "reactor" should be changed to --reactor system-- for consistency in terminology (cf., claims 11 and 17, first line of each).

Claim 19 has been cancelled, without prejudice, therefore this rejection is moot and should be withdrawn.

Claims 6, 7 and 16 have been rejected under 35 U.S.C. §112, second paragraph, for alleged indefiniteness of use of the phrase "such as" in claims 6 and 16. Also, claims 6 and 16 allegedly are indefinite due to improper Markush language in the recitation

“selected from the group comprising ... or liquid”. The Office Action alleges that there is no proper antecedent basis for this limitation in claim 16 or in any claim from which claim 16 currently depends for the limitation “the separation fluidum” (see lines 1-2). The Office Action alleges that claim 19 does not set forth any steps involved in the method/process, therefore it is unclear what method/process applicant it is intending to encompass.

Applicant respectfully traverses this rejection and request that the rejection be reconsidered and withdrawn.

The Examiner's focus during examination of claims for compliance with the requirement for definiteness of 35 U.S.C. §112, second paragraph, is whether the claim meets the threshold requirements of clarity and precision. M.P.E.P. §2173.02. The essential inquiry pertaining to this requirement is whether the claims set out and circumscribe a particular subject matter with a reasonable degree of clarity and particularity. Id. Definiteness of claim language must be analyzed, not in a vacuum, but in light of:

- (A) The content of the particular application disclosure;
- (B) The teachings of the prior art; and
- (C) The claim interpretation that would be given by one possessing the ordinary level of skill in the pertinent art at the time the invention was made. Id.

While Applicant respectfully disagrees with the reasons for rejection, claims 6 and 16 have been amended to delete the phrase “such as” and to change “comprising” to “consisting of”, without prejudice, to expedite allowance of the application. Claim 19 has been canceled, therefore the rejection of this claim is moot. Accordingly, Applicant respectfully requests that this rejection be reconsidered and withdrawn.

Claim 19 has been rejected under 35 U.S.C. §101 because claim 19 allegedly recites a use without setting forth any steps involved in the process. While Applicant respectfully traverses and disagrees with the reasons for rejection, claim 19 has been cancelled to expedite allowance of the application, without prejudice. Applicant expressly reserves the right to file one or more continuation or divisional applications directed to the canceled subject matter thereof. Accordingly, Applicant requests that the rejection of claim 19 be reconsidered and withdrawn.

Claims 1-19 have rejected under 35 U.S.C. §102(b) as anticipated by or, in the alternative, under 35 U.S.C. §103(a) as obvious over either of PCT Publications WO 00/02929 or WO 00/69552.

The Office Action notes that the subject matter of present claims 1-10 is a process for the catalytic polymerization of olefins, wherein olefins are contacted with a particulate catalyst in a fluidized bed and in a moving bed such that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled. The Office Action further notes that the subject matter of claims 11-19 is a reactor system comprising a fluidized bed reactor provided with a reactant inlet, a product outlet and means for maintaining a fluidized bed in the fluidized bed reactor and with a moving bed reactor provided with an inlet directly connected to the fluidized bed reactor and an outlet connected to the fluidized bed reactor such that the residence time in the fluidized bed reactor and the residence in the moving bed reactor are independently controlled.

The Office Action alleges that WO '929 discloses a gas phase polymerization process in two interconnected reaction zones, wherein in the first zone solid particles rise up caused by the fluidization and in the second zone the particles sink downwards under the influence of gravity. The Office Action further alleges that in the second zone (downcomer) of the disclosed reactor, another gas composition can be adjusted as in the first zone (riser) thereof by feeding a gas and/or liquid into the downcomer through a line placed preferably at an upper part thereof, referring to Figures 1 and 4 of WO '929, allegedly depicting a reactor similar to the embodiment of Fig. 5 of the instant application. The Office Action alleges that in reference to Figure 1 of WO '929, it is stated that the flow rate of this gas feed can be regulated so that a flow of gas counter-current to the flow of polymer particles is originated in the downcomer, thus acting as a barrier to the gas mixture coming from the riser which is entrained among the polymer particles, referring to WO '929 at page 7, second full paragraph. The Office Action contends that one skilled in the art would have immediately envisaged that the residence time in the downcomer (allegedly corresponding to applicants' moving bed reactor) is susceptible of being controlled independently of the residence time in the riser (allegedly corresponding to applicants' fluidized bed) through regulation of the flow rate of this feed gas into the downcomer of the disclosed reactor. The Office Action further alleges that, alternatively, even if WO '929 does not anticipate the claims either explicitly or under inherency principles, it would have been obvious to one of ordinary skill in the art to

judiciously regulate the gas flow rate to the downcomer section of the disclosed reactor so as to minimize the amount of gas in the discharged polymer, with the predictable effect of controlling residence time of the moving particles in the downcomer independent of residence time in the riser section of the reactor disclosed by WO '929.

The Office Action alleges that WO '552 discloses a fluidized bed polymerization process using a reactor which is horizontally separated into different chambers. On page 5, line 5 to page 9, line 32, the Office Action alleges that WO '552 discloses that the recycle liquid can be introduced in such a way that different concentrations of the liquid are present in different parts of the reactor, referring to WO '552 at page 5, lines 11-20; page 8, line 15 to page 9, line 13 and Figs. 2-4. The Office Action contends that WO '552 implicitly teaches independent control of the compositions of the two compartments and, thus the possibility of establishing different fluidization conditions, and hence different residence times of fluidized particles in the different chambers of the disclosed reactor (corresponding to Applicant's fluidized bed and moving bed reactor elements) allegedly would have been immediately envisaged by one skilled in this art, or in the alternative, allegedly constitutes an obvious modification of the polymerization conditions disclosed by WO '552 to an ordinarily skilled practitioner.

Applicant respectfully traverses this rejection and request that the rejection be reconsidered and withdrawn.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

As reiterated by the Supreme Court in *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. ___, 82 U.S.P.Q.2d 1385 (2007), the framework for the objective analysis for determining obviousness under 35 U.S.C. §103 is stated in *Graham v. John Deere*. Examination Guidelines for Determining Obviousness Under 35 U.S.C. 103 in View of the Supreme Court Decision in *KSR International Co. v. Teleflex Inc.*, 72 Fed. Reg., No. 195 (October 10, 2007) at page 57527 (hereinafter "Examination Guidelines"). The factual inquiries enunciated by the Court are as follows:

- (1) Determining the scope and content of the prior art;
- (2) Ascertaining the differences between the claimed invention and the prior art; and

(3) Resolving the level of ordinary skill in the pertinent art.

Examination Guidelines at page 57527.

Independent claim 1 of the present invention provides a process for the catalytic polymerization of olefins, wherein olefins are contacted with a particulate catalyst in a fluidized bed and in a moving bed such that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled *by controlling the inflow of polymeric particles into the moving bed or by controlling the outflow of polymeric particles out of the moving bed*. Independent claim 11 of the present invention provides a reactor system comprising a fluidized bed reactor provided with a reactant inlet, a product outlet and means for maintaining a fluidized bed in the fluidized bed reactor and with a moving bed reactor provided with an inlet directly connected to the fluidized bed reactor and an outlet connected to the fluidized bed reactor such that the residence time in the fluidized bed reactor and the residence in the moving bed reactor are independently controlled, *by controlling the amount of polymeric particles entering the moving bed or by controlling the outflow of polymeric particles out of the moving bed*.

Neither WO 00/02929 nor WO 00/69552 suggests or discloses a process or reactor system for the catalytic polymerization of olefins comprising a fluidized bed and a moving bed such that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled *by controlling the inflow of polymeric particles into the moving bed or by controlling the outflow of polymeric particles out of the moving bed*, such as is presently claimed in claims 1 and 11.

If the polymer enters the downcomer (2) through the top opening therein and exits through the bottom opening thereof, it appears that some gas would enter the downcomer (2) through the bottom opening thereof and this would be likely to cause the polymer in downcomer (2) to be in a fluidized state and not in a settled state.

Furthermore, neither WO 00/02929 nor WO 00/69552 suggests or discloses using a separation fluidum to separate the moving bed from the fluidized bed, as set forth in present claim 4.

Also, neither WO 00/02929 nor WO 00/69552 suggests or discloses a reactor system in which the inlet of the moving bed reactor is arranged in the fluidized bed reactor, as set forth in present claim 12.

For at least the reasons set forth above, pending claims 1-18 and new claim 20

are novel and unobvious over WO 00/02929 nor WO 00/69552. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the above rejections.

Claims 1-16, 18 and 19 have been rejected under 35 U.S.C. §102(e) as being anticipated by Covezzi et al. (U.S. Patent No. 7,414,098). The Office Action contends that Covezzi et al have disclosed a process for gas-phase catalytic polymerization of olefins in a plurality of interconnected polymerization zones, including zones (1), (2) and (3) (see Figs. 1-5). The Office Action alleges that Zone (1) is set up inside the fluidized bed; zone (2) is defined by one or several pipes, placed in vertical position, preferably coaxial with the fluidized bed reactor, each having an inlet located within the fluidized bed region of the reactor (hence directly connected to the fluidized bed reactor) and an outlet connected to the fluidized bed reactor via zone (3), established in a pipe 3' placed externally to the reactor and connecting the bottom of pipe 2' with the fluidized bed reactor at a point situated above the fluidized bed 1'. The Office Action further alleges that in the polymerization zone (3), fast fluidization or transport conditions are involved, so that the polymer particles flow upward through said polymerization zone and are then reintroduced into the first polymerization zone (1). (See col. 6, lines 17-35 and Fig. 1). The Office Action contends that Covezzi et al state that different working conditions can be established in each polymerization zone as regards the concentration of molecular weight regulator, monomer and comonomers, enabling polymeric chains with a different composition and/or different average molecular weights to be obtained in the different polymerization zones of the disclosed reactor (col. 5, lines 45+). The Office Action refers to Fig. 5 of Covezzi et al, alleging that it discloses to introduce a liquid barrier stream (depleted in hydrogen as per col. 12, lines 1-15) into the upper part of the second polymerization zone (2), which acts as a stripping column to further remove the volatile component (e.g., hydrogen) from the gas stream flowing downward along the second polymerization zone (2) (Id., lines 20-27). The Office Action alleges that it is stated that by carefully balancing the flow of the solid through the section of inlet in the second polymerization and the amount of liquid fed through line 15, the partial evaporation of the barrier stream gives rise to a gas flowing upwards toward the velocity reduction zone 5, where it will be sent to recycle line 6 (Id., lines 35-40). The Office Action contends that the described balancing of the flow of solids through the inlet section of the second polymerization zone and the amount of liquid fed to the upper portion of that zone would have been understood by the art-skilled as enabling the residence time of particles in the

fluidized bed of Covezzi et al. (zone (1), allegedly corresponding to applicants' fluidized bed reactor) and the residence time in their second polymerization zone (allegedly corresponding to applicants' moving bed reactor) to be independently controlled in the manner recited in applicants' claims. The Office Action concludes that ,as such, Covezzi et al is deemed to provide a proper basis for anticipation of claims 1-16, 18 and 19.

Covezzi et al. does not suggest or disclose a process or reactor system for the catalytic polymerization of olefins comprising a fluidized bed and a moving bed such that the residence time in the fluidized bed and the residence time in the moving bed are independently controlled *by controlling the inflow of polymeric particles into the moving bed or by controlling the outflow of polymeric particles out of the moving bed*, such as is presently claimed in claims 1 and 11.

Covezzi et al. does not suggest or disclose using a separation fluidum to separate the moving bed from the fluidized bed, as set forth in present claim 4.

For at least the reasons set forth above, pending claims 1-16, 18 and new claim 20 are novel and unobvious over Covezzi et al.. Accordingly, Applicant respectfully requests reconsideration and withdrawal of the above rejections.

Applicant respectfully asserts that all of the pending claims comply with the requirements of 35 U.S.C. §112 and distinguish over the cited prior art as set forth in the Office Action. Accordingly, Applicant respectfully requests entry and consideration of the above amendments and allowance of all of the pending claims.

Respectfully submitted,
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